Behavioural design workbook - an introduction to behavioral design and its application in Copenhagen Commune

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Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

Behavioural design workbook

An introduction to behavioural design and its application in Copenhagen Commune

KØBENHAVNS KOMMUNE

IDE DTU

Front matter

This workbook is part of a behavioural design project between DTU Management Engineering and Byens Drift (Teknik- og miljøudvalget in The City of Copenhagen), winter 2016-17.

Collaborative partners

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If you would like more information, we would direct you to the below works upon which this workbook is based:

Cash, P., Gram Hartlev, C., & Durazo, C. B. (2017). Behavioural Design: A Process for Integrating Behaviour Change and Design. Design Studies, 48(January), 96–128.
Tromp, N., & Hekkert, P. (2016). Assessing methods for effect-driven design: Evaluation of a social design method. Design Studies, 43(2016), 24–47.

For further references and refferals go to the back of the workbook.

The behavioural design workbook - an introduction to behavioural design and its application in Copenhagen Commune.

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Version 1.0. Published February 2017.

Preface and acknowledgements

In Denmark 1 out of every 21 Danes have Type 2 diabetes. This is often driven by lifestyle choices, such as smoking, and lack of regular exercise. The number has doubled over the last 10 years, and is estimated to double again in the next 10 years. Ultimately type 2 diabetes costs Denmark app. 86 mio. DKK a day*. In a purely rational world, individuals at risk would smoke less and exercise more, particularly given Danes are often considered very health-conscious, and Denmark being a world leader in diabetes awareness. So why don't people follow this rational course of action?

We find the answer to this question in the roots of human behaviour, and in the dominant forces that drive it; habits and our unconscious mind. Thus it is these forces that behavioural design seeks to leverage when we want to ethically shape behaviours that are better for both people and society.

Purpose and content

In this workbook we describe behavioural design as an approach suitable for tackling problems rooted in irrationality and the complex interactions between the individual and society. We introduce the behavioural design mindset and approach as complementary to classic design thinking. Thus, behavioural design forms a systematic design approach that can produce solutions that work with human behaviour – instead of against it, and give the designer a practical guide for achieving this in practice. We aim to illustrate the potential benefits of applying behavioural design both in Copenhagen Commune and other similar contexts.

* See: http://www.diabetes.dk/presse/diabetes-i-tal/diabetes-i-danmark.aspx

This workbook will help you to answer the following questions:

1: What is human behaviour and how can it be changed?

2: When and how should you consider applying behavioural design?

3: How is behavioural design conducted?

4: How has behavioural design been applied?

Acknowledgements

The authors would like to give a special thanks to Søren Ærendal Mikkelsen and Kira Gizella Olah Thume, from Teknik- og Miljøforvaltningen, Byens Drift, Driftsudvikling, for their support in making this workbook. In addition, a special thanks also goes to Anders Melamies and Christina Dam-Andersen from Teknik- og Miljøforvaltningen, Byens Drift, Drift Nord. Also, the authors would like to thank Morten Lindhardt Madsen, master student at DTU, for contributing to Chapter 2. A special thanks go to Charlotte Hartlev, Christine Durazo, Johan Aakerlund, and Camilla K. E. Bay Nielsen, who contributed substantially to Chapter 3. Last, the authors would like to thank all the current and previous master students at DTU that have conducted the master projects showcased in Chapter 4, including: Sebastian Borum Olsen, Christoffer Holm-Hansen, Mette Louise Christensen, Yen Mai Thi Trihn, David John Ginty, Tobias Alban Nielsen, Francesco Faberi, and Malte Ahlgren.

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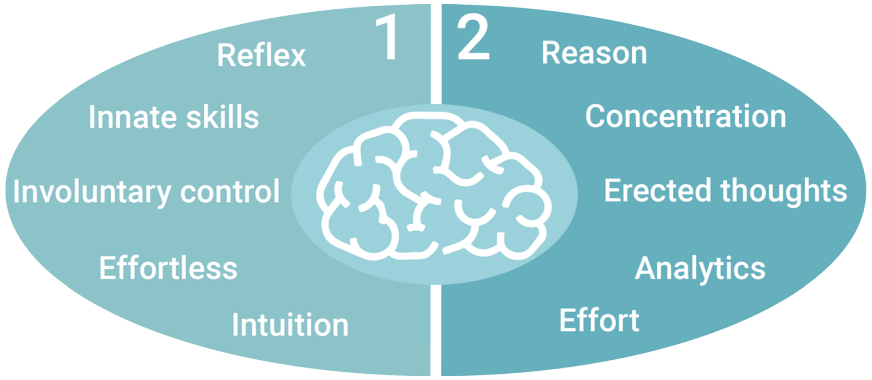
1 What is human behaviour, and how can it be changed?

1.1 - How does human behaviour work?

‘Behaviour’ describes how we as human beings act, as well as how we respond to particular situations or stimuli. Behaviour shapes our interaction with other people as well as with products and our surroundings. However, the impact of this behavioural interaction between human beings and designed solutions is often underestimated when designing. In order to address this, we must be able to understand and describe the key elements of human behaviour. Although there are many theories that aim to explain behaviour, two basic models are particularly useful for the designer:



- **Dual process theory – two systems**
- **Antecedent-Behaviour-Consequence (ABC)**

Dual Process Theory - two systems

In this model human decision making and behaviour are driven by two main neurological systems:

- **System 1** – automatic: Our unconscious, irrational mind, responsible for fast automatic decision making and behaviour.
- **System 2** – controlled: Our conscious, rational mind, responsible for slow deliberate decision making and behaviour.

Of these two systems, the automatic unconscious mind (System 1) drives approximately 95% of all our behaviour. For example, it is the dominant force behind habits, fast reactions, and everyday decisions. Thus, when we design for deliberate analytical thought and subsequent good behaviour (System 2), we miss automatic every day behaviours. This misplaced focus on designing for System 2 thinking in planning and interventions, has led to many design failures.

Dual Process Theory helps to explain why people e.g. litter, despite the many signs forbidding it, and the possibility of punishment if they are caught. Here, the potential litterer is required to activate System 2 and mentally connect the dots between the sign, their behaviour, and possible future punishment. Instead, what often happens is that System 1 takes over and the person throws the litter without conscious

thought. Despite this, if questioned, people will often rationalise how they in fact did see the signs, and convince themselves that the rules didn't apply to them in this case. For example, one might post-rationalize that because the nearest public bin was full it was ok to litter. This is due to the fact that most of us have trouble recognizing that the majority of our behaviour is automatic – and that this is both normal and inevitable. This disconnect means that we as humans tend to perceive our own behaviour differently from what we actually do.

Knowing and accepting that the majority of human behaviour is automatic enables the designer to design for System 1 instead of against it. Effective solutions build on both System 1 and 2 to generate immediate impact and foster sustainable, long term change.

Antecedent – Behaviour – Consequence (ABC)
In the ABC model behaviour is divided into 3 linear steps - antecedent, behaviour, and consequence.

- **Antecedent:** The thing triggering a behaviour just prior e.g. finishing a bottle of water while walking down the street.
- **Behaviour:** The behaviour itself e.g. throwing the bottle on the ground.
- **Consequence:** The outcome of the behaviour just after e.g. continuing to walk down the street.

This breakdown allows the designer to describe behavioural interactions over time, and helps to explain when and where behaviour can be influenced. Designers can influence behaviour just before via the antecedent, during, or just after via the consequence. For example, speed limit signs, speed bumps, and speed cameras are three different ways of approaching speeding behaviour. The first targets the 'antecedent', the second the 'behaviour' itself, and the third the 'consequence'.

Combing the ABC model and Dual Process Theory, we can see that most ‘consequence’ strategies require activation of System 2, and thus do not take advantage of the large amount of behaviour directed by System 1. Specifically, System 1 is often dominant during in antecedent > behaviour steps, thus more successful strategies also include interventions during these steps, tailored to influence our automatic mind. Effective designs connect to all three steps in the ABC model, and target both System 1 and 2, just prior, during, and just after the unwanted behaviour.

Antecedent → Behaviour → Consequense

1.2 - How can behaviour be influenced?

Once you have decided to influence behaviour and have mapped out the ABC and associated System 1 and System 2 elements, you need a strategy. Here, there are three aspects to consider:

- **Combining motivation, ability, and trigger**
- **Encourage or discourage behaviour?**
- **Strong/weak and explicit/implicit interventions**

Combining motivation, ability, and trigger

Fogg's (2009) Behaviour Model explains that if we want to influence behaviour we must always design for motivation, ability, and trigger in combination.

- **Motivation:** The person is consciously (System 2) or unconsciously (System 1) driven to carry out the new behaviour.
- **Ability:** The person is able to carry out the new behaviour.
- **Trigger:** The person is stimulated to act on the motivation and ability and actually carry out the new behaviour at the right time in the right place.

Combining these elements simultaneously at the time and place where the desired behaviour should take place is key to a successful design intervention. Further, combining multiple interventions that complement each other produces more robust designs with greater chance of success. The ultimate goal is to use multiple interventions to make the new behaviour more desirable than the normal behaviour i.e. more motivated, more able/easier, and with a stronger trigger, using both systems at each stage of the ABC.

Encourage or discourage behaviour?

Based on the idea of making the new behaviour more desirable the designer can choose to either positively encourage the new behaviour or negatively discourage the old behaviour. Although both approaches can provide valuable interventions, discouragement should be considered very carefully before implementation. This is because constraint, negativity, and punishment can often pose significant ethical and moral dilemmas, and can engender negative reactions in the target audience.

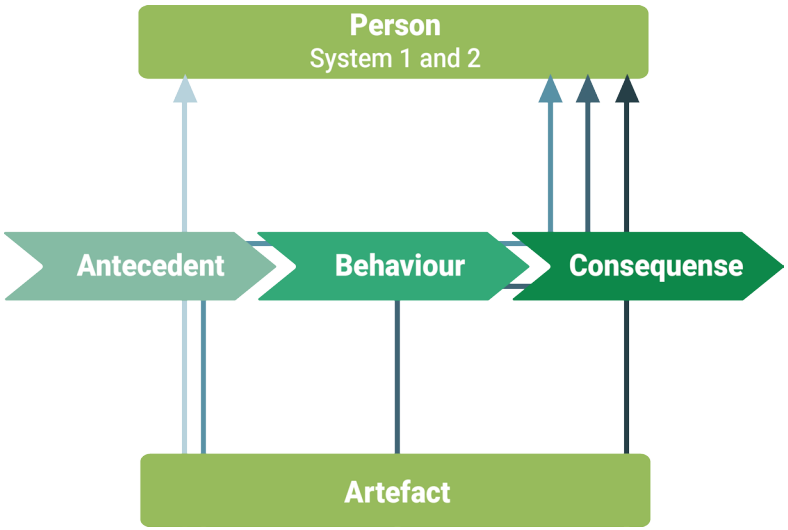
Although coercion and the removal of freedom of choice can be effective they are often associated with negative consequences, such as, poor user experience or subversion of the intended behaviour. Good designs always consider the 8 golden rules of behaviour change, and the best designs focus on making things, better, easier, and more desirable (see section 2.2 “Responsibility and ethics”).

Strong/weak and explicit/implicit interventions

Based on the idea of using multiple complementary interventions Tromp el al. (2011) describes interventions on two axes:

- **Strong/weak:** Does it directly affect the person; are they compelled to act?
- **Explicit/implicit:** Is the person consciously aware of the intervention itself as well as its purpose?

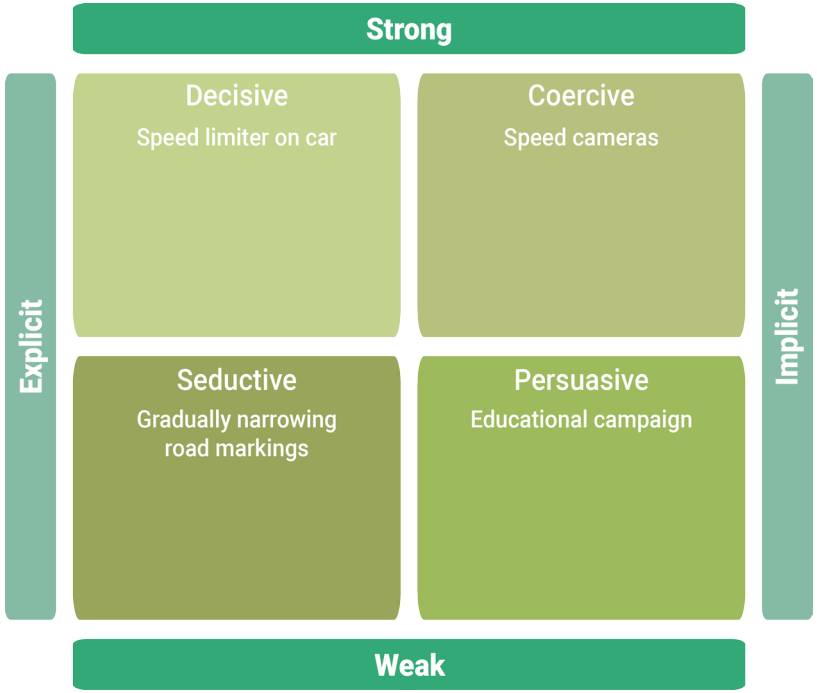
Typically, implicit interventions are associated with System 1 thinking while explicit connect to System 2. All types of interventions can be linked to any of the ABC steps. Further, these can be combined, as in the speeding example, by targeting multiple steps in the ABC as illustrated by Cash et al. (2017).



To change human behaviour, the listed strategies can be applied to the antecedent, behaviour, and consequence steps, and can combine explicit and implicit elements.

Taking the speeding example: speed cameras are strong and explicit (coercive), while an anti-speeding educational campaign is week and explicit (persuasive), gradually narrowing road markings to unconsciously slow the driver is weak and implicit (seductive), and placing a speed limiter on the car itself is strong and implicit (decisive). It is worth noting that these interventions also collectively address all the steps in the ABC model.

Effective designs take advantage of all of the elements outlined in this chapter: targeting both System 1 and 2 thinking; making new behaviour more desirable at each step of the ABC; providing multiple means of motivation, ability, and trigger; and enacting these via interventions using a range of complementary approaches – explicit and implicit.



1.3 - Summing up

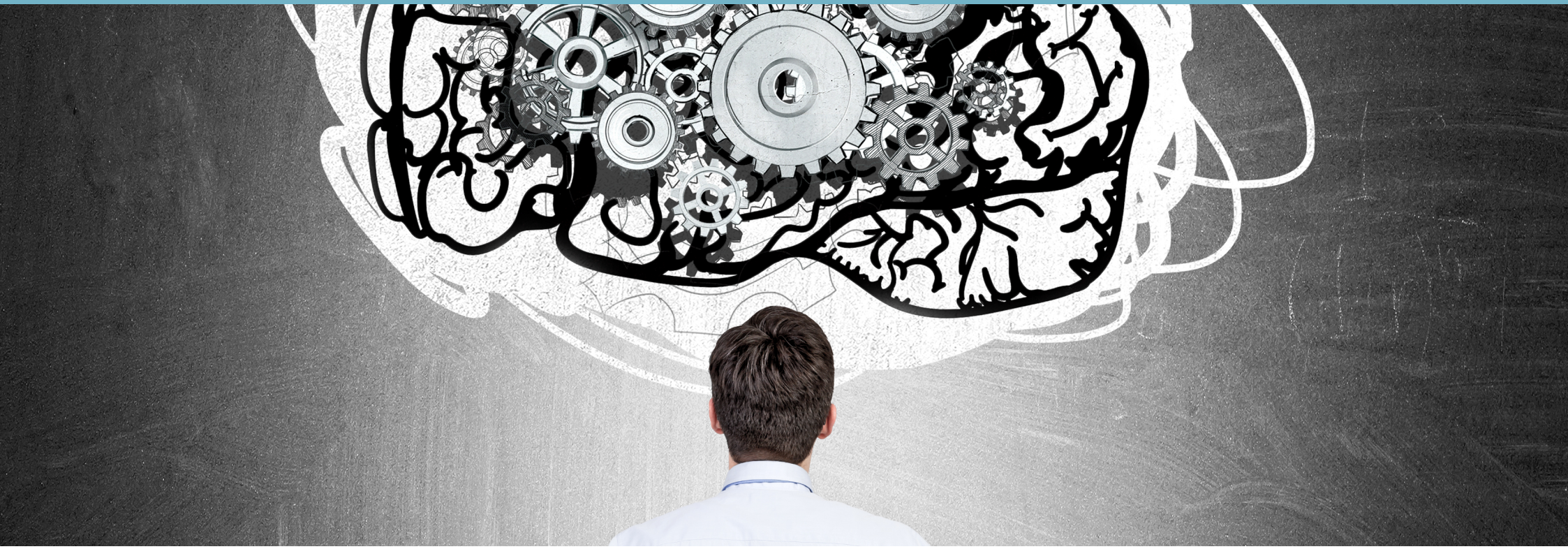
To achieve effective behavioural design, you should:

Consider all aspects of behaviour, and connecting System 1 and System 2 thinking to the wider social context

Address antecedent, behaviour, and consequence cohesively

Combine multiple complementary interventions, strong and weak, implicit and explicit

2 When and how should you consider applying behavioural design?



2.1 - When should behavioural design be applied?

As highlighted in Chapter 1 behavioural design is complementary to classical design approaches, particularly when the root cause of a problem is related to behaviour. At the most basic level behavioural design can only be applied when there is a distinct behaviour that can be described. Further to this, the artefact used as the means of delivering the behavioural intervention, must itself work before any behavioural considerations can be made.

For example, if you want to change phone related behaviour via an application, the phone and application must themselves technically function. Effective behavioural design incorporates both the technical and behavioural to produce a solution that works across each of the elements described in Chapter 1.

Given a problem related to behaviour there are a number of more specific cues that should point the designer towards or away from applying behavioural design. In this section we outline the main cues for and against behavioural design.

Prerequisites for applying behavioural design:

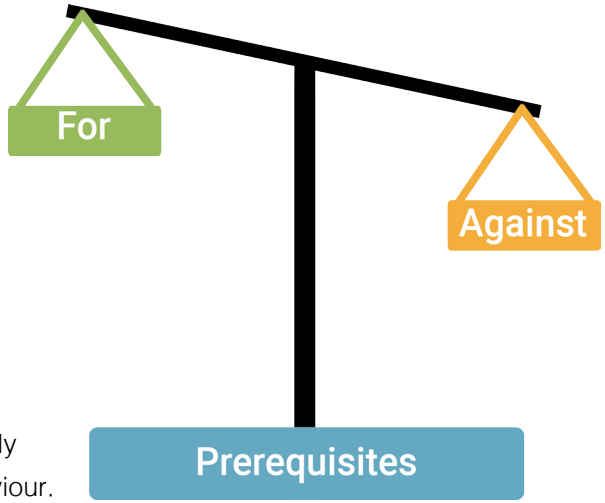
- A behaviour connected to the problem can be described (see Chapter 1).
- The technical solution is functional.
- Organisational commitment to evidence based design.

For applying behavioural design:

- Existing solutions are technically optimised and thus behaviour offers an opportunity for low cost improvement (see also Rebound effect).
- Existing solutions already directly shape user behaviour.
- Existing un-wanted behaviours can be described.
- The behaviour connects individual and collective concerns.

Against applying behavioural design:

- No clear motivation can described for the desired behaviour.
- No means can be identified for delivering motivation, ability, and trigger (see Chapter 1).
- Actors are not aware of the behaviour or its related consequences.
- Current behaviour is substantially different from the desired behaviour.



Prerequisites

Technical

The target product/environment is technically functional. If the product does not work, people will not use it, and any intervention will be lost. This is related to Ability (see Chapter 1)

Example: A phone application based intervention met all the behavioural criteria but was poorly integrated across operating systems leading users to abandon its use.

Behavioural

A behaviour must be able to be identified and described at least with respect to the ABC model and motivation, ability, and trigger (see Chapter 1).

Example: Smoking behaviour can be clearly described in terms of the ABC: finish cigarette, throw butt, walk on; and motivation, ability, and trigger: reword/punishment, adding bins or a butt recycling part to the packaging, finishing the cigarette provides a clear point for trigger delivery.

Organisational

Behavioural design demands testing and evaluation of behavioural data. Thus there must be sufficient organisational commitment to testing interventions, allocating resources for iterative test and development, and being open to evidence based decision making.

Cues *for* applying behavioural design

Product related

Current solutions involving the target behaviour are technically optimised/further optimisation is prohibitively expensive. Or Rebound effects are observed, i.e. the product has been improved but the benefits from this improvement are negated by the users' behaviour.

Example: Home heating systems are highly optimised, and as heating efficiency has increased users have typically heated more – negating many technical improvements. As such, changing behaviour via interventions such as smart meters provide cost effective means of improving overall efficiency.

Current solutions already directly shape behaviour. Changing existing behaviours can be much easier than attempting to promote totally new or unfamiliar behaviour. The user understands the artefact differently from the intent of the designer or is only missing one part of motivation/ability/trigger.

Example: Smart meters for home heating tap into already existing heating related behaviours such as checking the temperature, and the user already has motivation and ability to reduce heating. Thus modifying the meter to enhance motivation via e.g. feedback, and add triggering elements provides good opportunity for intervention.

Key opportunities here are:

- **Add a behavioural perspective to previously technical problems**
- **Add/enhance missing motivation/ability/triggers**
- **Map the reasons for faulty understanding of design intent in the target audience**
- **Re-design the solutions intent based on the existing faulty understanding**

Cues *for* applying behavioural design

Behaviour related

The target behaviour is linked to a specific group or norm. Thus behaviour can be changed by connecting / disconnecting a user from a specific group, or connecting to a desired standard of behaviour in a given social group.

Example: The actor needs to break out of a group in order to behave as intended; The actor behaves against the social concern of a group.

The target behaviour is a habit or daily routine, carried out over a long period. Routine behaviours often become habitual and unconscious, making them ideally suited to behavioural interventions.

Example: Heating behaviour is typically habitual as it is the same every day, introducing feedback, or other elements that prompt the actor can disrupt old habits, and direct the formation of new ones.

The target behaviour is missing motivation/ability/trigger; particularly important if the actor faces too many choices.

Example: Change the motivation for performing the existing, unwanted behaviour by having e.g. benefits now, cost later or short term wins (the actor behaves to gain a small benefit now rather than a larger benefit later); or change the ability by making the desired behaviour easier than old behaviours.

Key opportunities here are:

- **Use groups or social norms to direct behaviour, and introduce interventions to break the patterns of behaviours.**
- **Enhance the difficulty and up-front costs of old behaviour and reduce difficulty and cost of the new behaviour.**
- **Reduce difficulty and increase awareness of target behaviour.**

Cues *against* applying behavioural design

Product related

The actor is missing a clear motivation for the new behaviour or there are many benefits of staying with the old behaviour. This can be related to functionality of the product or wider systemic issues.

Behaviour related

The behaviour cannot be described in a specific and measurable way. The actor's new behaviour cannot be broken down with respect to specific and measurable goals.

There is no awareness of the behaviour or its consensus. The actor needs to be aware of something before it can be influenced in many cases.

The existing behaviour is far from the new, desired behaviour. The further current behaviour differs from the new desired behaviour the more difficult the design task.

2.2 - What mindset do you need?

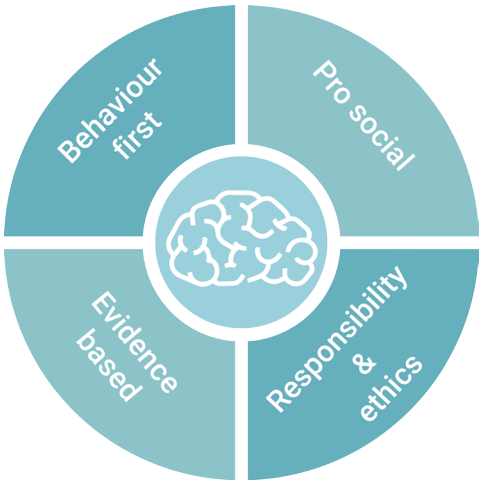
A design mindset describes the overall values and principles connected to the design approach, hence, all types of design have a specific, associated mindset. There are four key tenets of the behavioural design mindset:

1) Behaviour first

2) Pro-social

3) Evidence based

4) Responsibility and ethics



Behaviour First

Ultimately behavioural design prioritises designing for behaviour. Unlike traditional design practice it is essential that the design team focus on the behavioural aspects first, and allow these to drive the definition of the product, rather than adopting a more technical, function driven mindset. While technical solutions focus on physical demands e.g. a hearing aid, or a product-service system to public transportation, e.g. “Rejsekortet”, the products of behavioural design build on interventions i.e. features of the design that trigger a wanted reaction from the user in order to direct behaviour. Thus behaviour always leads design.

Pro-Social

Behavioural design always seeks to balance the interests of the group and the interests of the individual. It is not enough to know that a behaviour is better for the group e.g. less littering, it is important to understand why the individual performs the behaviour, and how changing it might affect them. Thus the behavioural designer must always balance individual and group concerns.

Evidence Based

As outlined in Chapter 1 people are not good at recognising, explaining, or predicting their own behaviour; thus we cannot simply ask people what they do. The only way to fully describe patterns of behaviour is to observe them systematically. This principle also applies when testing new designs or other solutions. Thus design proposals must be continuously challenged by real world data and experimental testing.

Responsibility and Ethics

When seeking to change behaviour, ethical and responsible conduct must always form the foundation for design. At every stage of the behavioural design process (Chapter 3) the designer must always answer the 8 rules of ethical persuasion, formulated by Berdichevsky & Neuenschwander (1999).

The 8 rules of ethical persuasion

1. The intended outcome of any persuasive technology should never be one that would be deemed unethical if the persuasion was to be undertaken without the technology or if the outcome occurred independently of persuasion.
2. The motivations behind the creation of a persuasive technology should never be such that they would be deemed unethical if they lead to more traditional persuasion.
3. The creators of a persuasive technology must consider, contend with, and assume responsibility for all reasonably predictable outcomes of its use.
4. The creator of a persuasive technology must ensure that it regards the privacy of users with at least as much respect as they regard their own privacy.
5. Persuasive technologies relying on personal information about a user to a third party must be closely scrutinised for privacy concerns.
6. The creators of a persuasive technology should disclose their motivations, methods, and intended outcomes, except when such disclosure would significantly undermine an otherwise ethical goal.
7. Persuasive technologies must not misinform in order to achieve their persuasive end.
8. **The Golden Rule of Persuasion:** The creator of a persuasive technology should never seek to persuade a person or persons of something they themselves would not consent to be persuaded to.

2.3 - Summing up

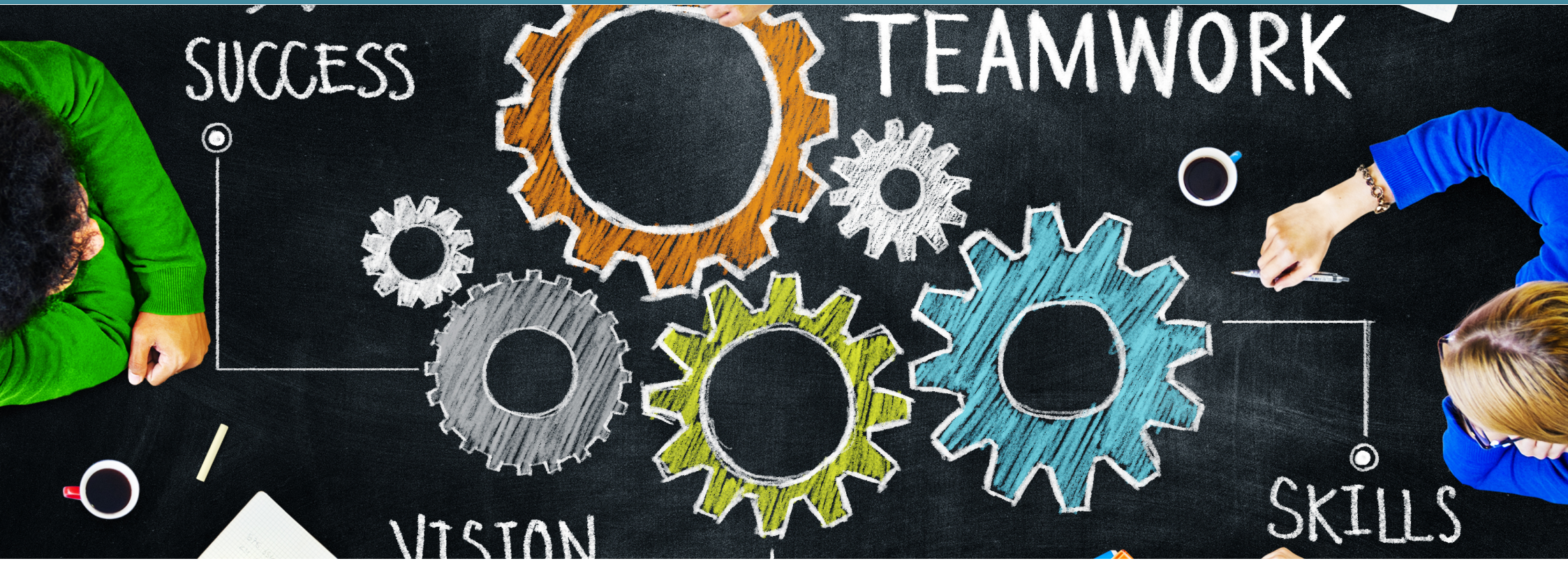
To achieve effective behavioural design, you should:

Ensure that the prerequisites are in place, and that a specific target behaviour can be described

Address all aspects of motivation, ability, and trigger

Build on rigorous behavioural data with an ethical and evidence first mindset

3 How is behavioural design conducted?



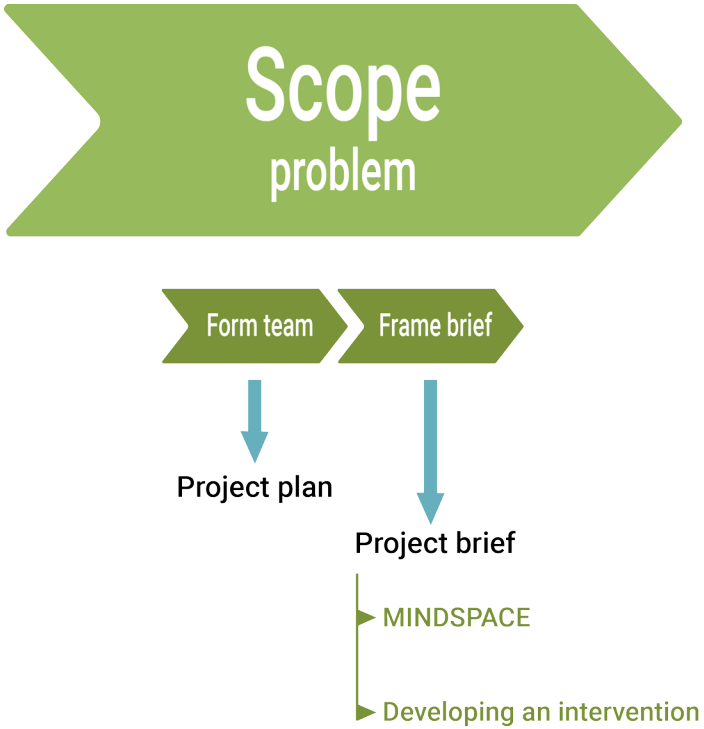
3.1 - What process phases and steps do you go through?

Behavioural design largely follows the same stages as any conventional design process (see e.g. Ulrich and Eppinger 2003), with an emphasis on the behaviour that is to be changed and a strong pro-social and evidence-based mindset (see Cash et al., 2017).

In this chapter, we will describe the stages and steps that are characteristic of behavioural design. The approach described can be combined with other methods and approaches, and merely emphasizes those elements that are unique to behavioural design. The behavioural design process has five stages starting with scoping of a behavioural design project, and ending with delivery of the design to the client.


Verify
behaviour change
Deliver
to client
PRODUCT
Test effect
Refine product
Beta test
Prepare deliverables

3.2 - Scope problem



The first stage, ‘Scope problem’, supports teams in clearly defining the overall goals and problem and/or target behaviour. Furthermore, it emphasizes the formation of a suitable team that incorporates relevant expertise for the specific problem domain.

Form team

Although this step is generic to all design processes, particular attention should be paid to incorporating behavioural experts where possible in the behavioural design context. Effort should be made to integrate the varied expertise and ambitions of the team.

Frame brief and domain

In order to follow the behaviour first mindset, it is crucial that the main goals of the project as well as the problem domain are defined unambiguously and as concretely as possible, as perceived by all team members and the client.

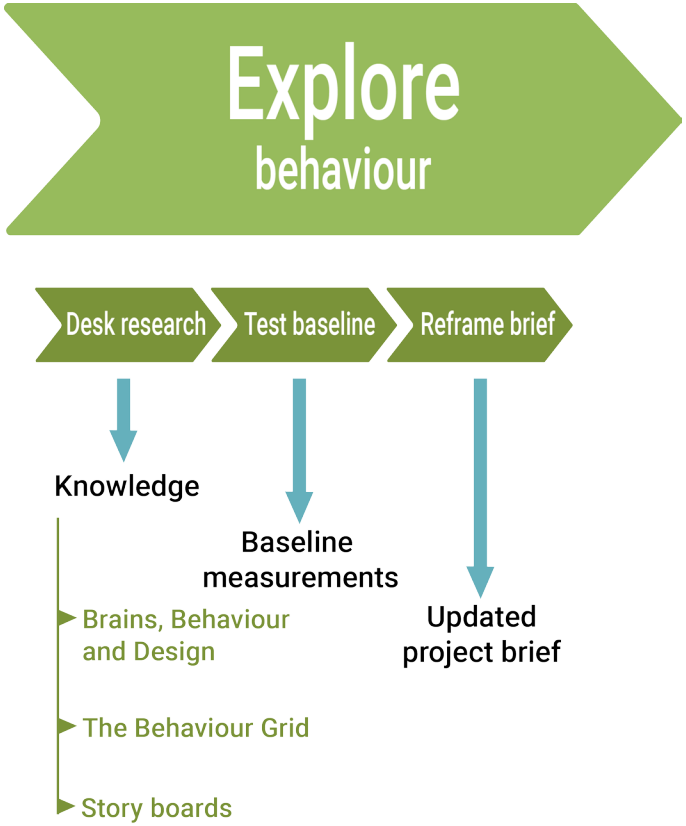
Possible tools and methods:

- **MINDSPACE**
  MINDSPACE is a framework that describes nine robust ways in which behaviour can be influenced: ‘messenger’, ‘Incentives’, ‘norms’, ‘Defaults’, ‘Salience’, ‘Priming’, ‘Affect’, ‘Commitment’, and ‘Ego’. In this stage of a project, the MINDSPACE framework can be used to determine in which direction(s) the project might go. The framework helps a team to scope-down the problem and solution space by limiting the behavioural mechanisms that might be relevant.

- **Developing an Intervention**

  The Developing an Intervention toolkit supports the design team in working through a mapping of the group to be influenced, and supports a structured discussion of the associated opportunities for intervention. In particular, it highlights the need to set testable 'success' criteria to be evaluated at the end of the project.

3.3 - Explore behaviour



The second stage, 'Explore behaviour' supports teams with fully exploring the behaviour that is in focus. Often in traditional design, an initial design brief only provides limited information about the behaviour. It is important that teams investigate the behaviour more thoroughly, and – if needed – reframe the behaviour to better reflect the core of the problem as they see it. In this stage, the behaviour will be defined more precisely, and a baseline measurement is performed to enable later evaluation of intervention impact.

Desk research

Here the design team should gain a familiarity with the relevant behavioural models and theories that could support their intervention. Some of which are highlighted in Chapter 1, e.g. the ABC model.

Possible tools and methods:

- **Brains, Behavior & Design**

  The Brains, Behavior & Design toolkit supports a team with getting informed about behavioural theory using 'bite-sized' reference cards, and formulating a hypothesis for a problem behaviour at hand. The Reference Cards are organized along four distinct factors (expectations, time, loss, ownership) and four shortcuts (external cues, compartments, mental models and quick indicators).

- **The Behaviour Grid**

  This helps the design team evaluate what kind of change they want to make and how this should be implemented over time e.g. is the desired behaviour one-off or a permanent change.

- **Story boards**

  Storyboards can help to organize information about the behaviour in a structured, orderly way. Storyboards contain key information about the behaviour, highlight the challenges and/or problems and provide contextual information about influencing factors.

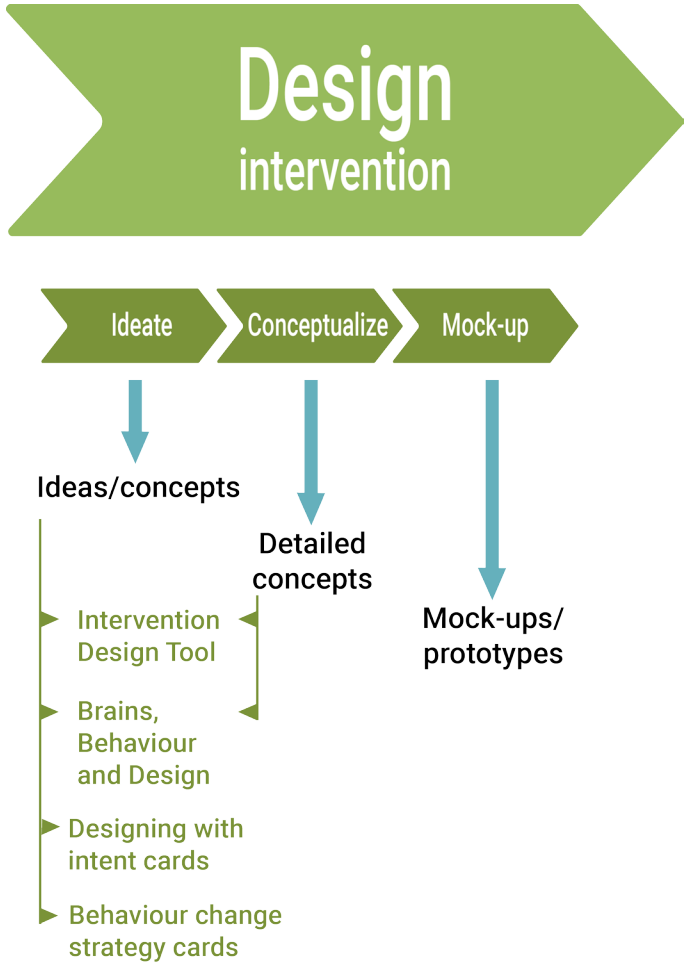
Test baseline

Behavioural Design requires that – besides the design of an intervention with the intent to change behaviour – a team also proves that the intervention has the intended effect. To do so, the team must have a baseline measurement of current behaviour to compare to the changed behaviour (after introduction of developed intervention(s)). Much behaviour happens subconsciously, and people are notoriously poor at reflecting upon their own behaviour in a reliable manner. Therefore, when measuring behaviour change (see Chapter 1), it is paramount that the team measures people's actual behaviour, rather than asking people about their perception of their behaviour. The team should also plan how they might test the impact of the intervention, as both measurements (test of baseline, and test of effect) should be performed in the same manner. Testing builds on standard scientific methods such as observation, experimentation, and randomised controlled trials, and is thus not elaborated here.

Reframe brief and domain

After the behaviour has been explored, the team is likely to have changed their perception of the problem, and thus needs to reframe the initial design brief to more accurately reflect their deepened understanding. It is not uncommon that the root causes of the problem have become clear and require the team to redefine the problem behaviour. The design team can again use tools such as MINDSPACE and requirements in order to complete this step (see Section 3.2).

3.4 - Design intervention



In the 'Design intervention' stage, the intervention is developed in an iterative process of ideation, conceptualization, and prototyping. Here mock-ups, that are able to be placed in a realistic environment or lab, are developed and can be used to verify the change in behaviour before the next stage. These prototypes do not need to be fully functional or 'finished' but should allow the team to test the way in which the intervention is intended to change the behaviour.

Ideate

The team is now ready to start generating ideas. Any ideas that were 'parked' earlier in the process can be included. A plethora of generic ideation techniques can be used in combination with more specific methods that are targeted at behavioural change.

Possible tools and methods:

- **The Intervention Design Tool**
  This helps the design team to prepare for a more systematic ideation, starting by including information learned in Stage 2 (Explore behaviour) by the behaviour in focus using analysing sheets. For the actual ideation, this method combines 'Ways to trigger', 'Trigger channels' and 'Behaviour means', into specific ideas or concepts. The method includes an evaluation sheet for the ideated ideas/concepts (see 'Conceptualize').

- **Brains, Behavior & Design/ Behaviour change strategy cards/ Designing with intent cards**
  Each of the above tools help the design team to work through different intervention types and to ideate

across the range of possible behaviour change strategies. For example, in Brains, Behavior & Design these are: 'Trying Something New', 'Good Intentions', and 'Delayed Gratification', while the Design with Intent toolkit deals with eight different lenses on behaviour change.

Conceptualize

Once one or more promising ideas have been selected the team can start to develop those into detailed concepts. This again builds on standard conceptualisation tools as well as specific behavioural design supports.

Possible tools and methods:

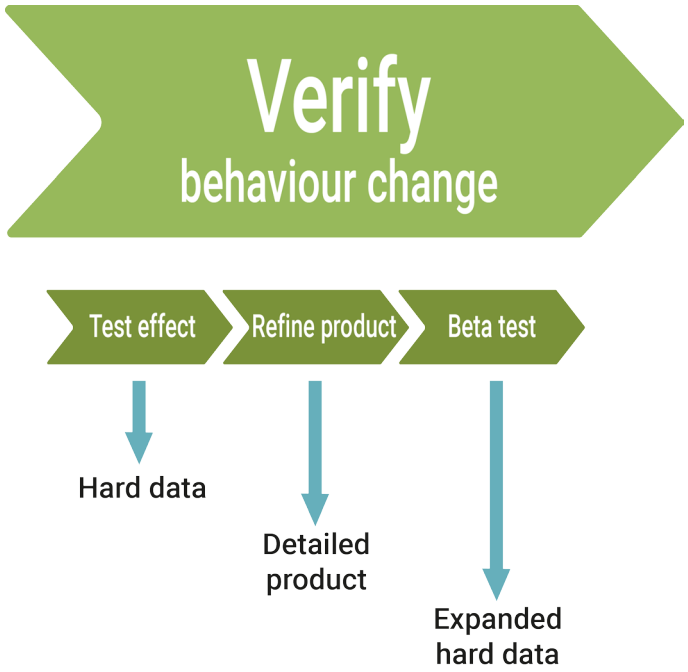
- **Flow chart from the Intervention Design Tool**
  This helps the design team to evaluate concepts and develop them into concrete solutions by working through a flow chart of typical challenges in the behavioural design context.

- **Loss/Gain worksheets from Brains, Behaviour and Design Toolkit**
  This helps the to designers work through the different Loss/Gain considerations associated with behavioural concepts as a team.

Make mock-ups

Once one or more concepts have been detailed to the extent that they can be tested, the team should build mock-ups that allow them to test the key mechanisms intended to change behaviour. There are various types of mock-ups possible, and depending on the mechanisms and the nature of the intervention, the team should select the most suitable type. However, mock-ups and prototyping are generic to all design work, and are therefore not elaborated on here.

3.5 - Verify behaviour change



In the 'Verify behaviour change' stage, the team should set up a test setting that allows them to compare the effect of the intervention on the new behaviour against the baseline (see Section 3.3). Based on their learnings, the team can refine the intervention and further develop it for beta testing.

Test effect

Once the concept has been chosen and a final mock-up/ prototype has been built, the team will test the impact of the concept on people's behaviour. Depending on the behaviour that is to be changed, and the nature of the intervention, different types of mock-up's might be suitable. It is important that the team reflects on the way that the effect can be measured, under which conditions and who needs to be convinced with the results, when choosing needed features of the final mock-up/prototype. This testing again builds on standard scientific methods such as experimental A/B testing, and randomised controlled trials.

Refine product

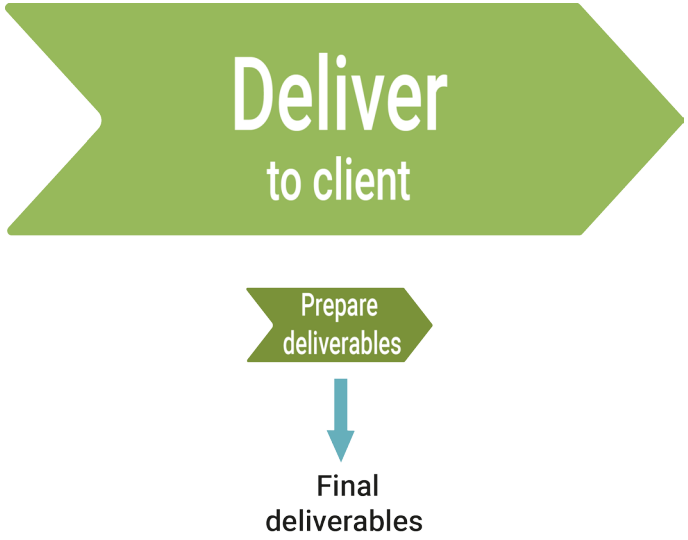
The intervention typically needs refinement based upon what has been learned in the test. To do this, the same tools as in the 'conceptualization' step (see Section 3.4) can be used.

Beta tests

Beta tests (small scale tests that explore the effects of the solution in a delimited area before rolling solution out on a big scale) is suitable for reducing costs of iterations. E.g. location might have greater influence on the success of the intervention - what works on Nørrebro might not work at Østerbro due to e.g. differences in demographics. Here, a beta test can help discover features to be iterated or e.g. area specific customized, before the solution has been rolled out in

all parts of Copenhagen. While beta testing, it is important to assess any unintended effects that might be generated, such as user rebound or counter behaviour. This again builds on standard observational methods.

3.6 - Deliver to client



In the final stage, ‘Deliver to client’, the team prepares the design intervention as well as the background information and test results for delivery in a way that is easily understood, so it can be taken up and rolled out. It is important that the rationale behind the intervention is clear and supported by the baseline/test data – i.e. how and why it is expected to change the behaviour – so that the client can inform and convince his or her stakeholders.

3.7 - Summing up

To achieve effective behavioural design, you should:

Work through all stages of the process while maintaining a focus on behaviour and an evidence based approach

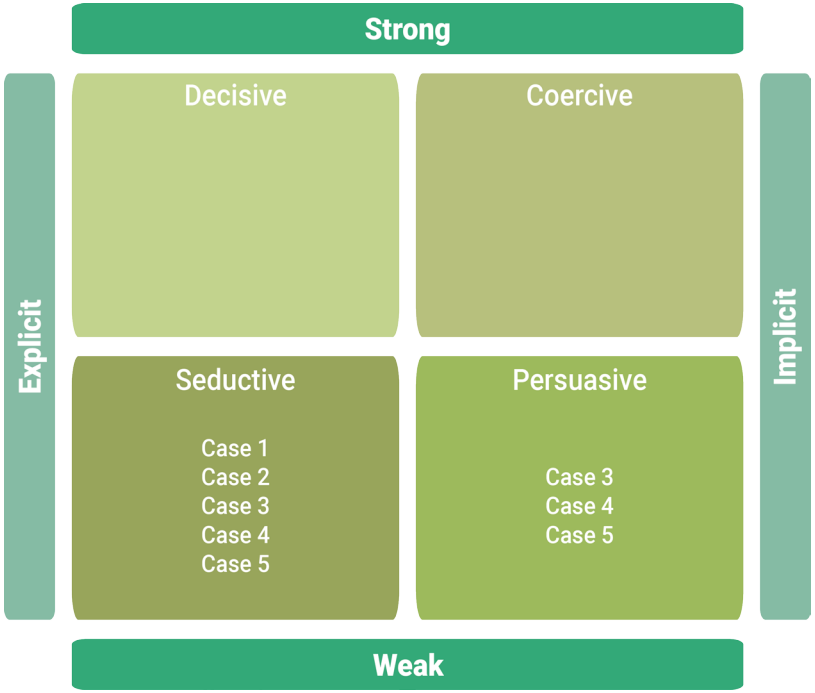
Incorporate the evidence based approach on established scientific methods of observation and testing

Ensure that behavioural success criteria are clearly defined, and unintended behaviour changes have been identified and eliminated

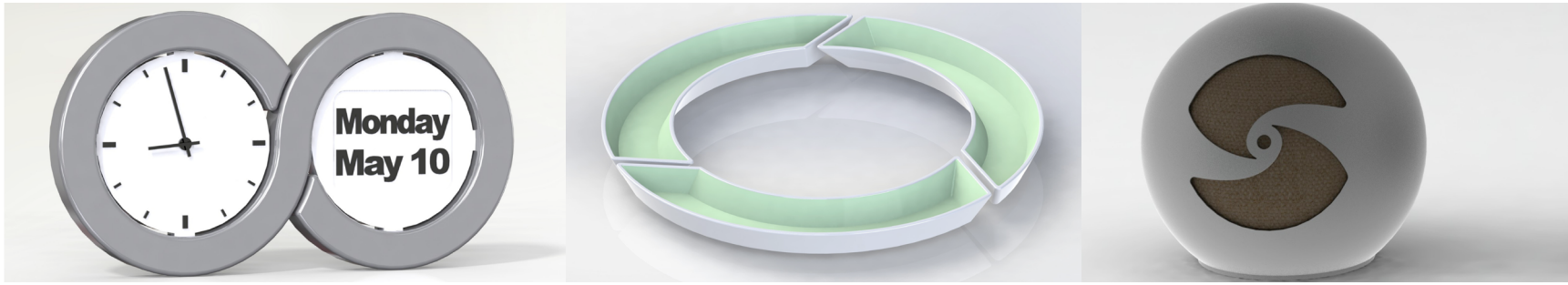
4 Inspirational cases: behavioural design in practice

4 - Inspirational cases: behavioural design in practice

In this chapter we showcase five examples of behavioural design projects conducted at the Technical University of Denmark. Each of the projects deal with different intervention strategies. In particular, these projects focus on Seductive and Persuasive interventions, as these are less common in practice. For example, Decisive and Coercive interventions are already common in the Commune context in the form of e.g. fines and regulations. In a number of cases these could be combined with the Seductive and Persuasive elements to expand the intervention. For example, adding a system for more effectively fining littering behaviour in Cases 4 and 5.



4.1 - Case 1: Nudging for a better world



Project scope

Seductively influencing users through the activation of norms associated with sustainable behaviour. The design team implemented this intervention in the physical design of 3 everyday objects: a set of bowls, speakers, and a clock.

Project approach and investigations

This project consisted of two studies examining the conceptualise > mock-up > test effect steps from Chapter 3. Study 1 identified shapes that people unconsciously associated with sustainability. This provided an evidence based means for conceptualising products that would trigger sustainable behaviour norms. Study 2 tested the effect of exposing users to everyday products incorporating these shapes.

To test the impact of shapes associated with sustainability a controlled experiment was used. Half the participants were exposed to three objects incorporating sustainable features, and half were exposed to regular products.

Results

The test found that rounded and interconnected shapes activated norms associated with sustainable behaviour, producing a significant effect in the test group. This project was followed by a project focusing on the effect of triggering using other senses (see case 2).

Key takeaways

- **Priming with shapes:**
  Significant effects were achieved by exposing users to artefacts developed to physically embody sustainable triggers. These activated System 1 without compromising the functionality of the products.

- **Evidence based approach:**
  The design team used an evidence-based approach to derive the sustainable triggers, as well as in testing the impact of the products. This is one of the key tenets of behavioural design.

This project was conducted as a master thesis by Sebastian Borum Olsen & Christoffer Holm-Hansen at DTU Management, spring 2016, supervised by associate professor Philip Cash. Results from this project contributed to the paper: Cash, P., Holm-Hansen, C., Borum Olsen, S., Christensen, M., & Thi Trinh, Y. (2017). Uniting individual and collective concerns through design: Priming across the senses. Design Studies, 49(C), 32–65.

4.2 - Case 2: Design through the senses

Project scope

Seductively influencing users through the activation of norms associated with sustainable behaviour, using non-visual triggers.

Project approach and investigations

This project consisted of two studies examining the conceptualise > mock-up > test effect steps from Chapter 3.

The first study derived sounds, smells, and textures that people unconsciously associated with sustainability. This provided an evidence based means for conceptualising products that would trigger sustainable behaviour norms.

The second study tested the effect of exposing users to everyday products incorporating these sounds, smells, and textures.

To test the impact of the different triggers (e.g. the sound of birds, the smell of grass, or a bark-like surface finish) a controlled experiment was used. Half the participants were exposed to three objects incorporating sustainable features and half were exposed to regular products.

Results

The test found that the features derived from Study 1 activated norms associated with sustainable behaviour, producing a significant effect in the test group.

Key takeaways

- **Priming across the senses:**
  Significant effects were achieved across all the senses tested: hearing, smell and touch. These activated System 1 without compromising the functionality of the products, and could be combined with the visual cues derived from Case 1.

- **Evidence based approach:**
  The design team used an evidence-based approach to derive the sustainable triggers, as well as in testing the impact of the products.

This project was conducted as a master thesis by Mette-Louise Hansen & Yen Thi Trinh at DTU Management, spring 2016, supervised by associate professor Philip Cash. Results from this project contributed to the paper: Cash, P., Holm-Hansen, C., Borum Olsen, S., Christensen, M., & Thi Trinh, Y. (2017). Uniting individual and collective concerns through design: Priming across the senses. Design Studies, 49(C), 32–65.

4.3 - Case 3: Behavioural design for back pain

Project scope

Help users achieve healthy back posture during everyday life using multiple interventions, targeting both System 1 and System 2.

Project approach and investigations

This project worked through all the stages in Chapter 3 to deliver two developed concepts: a software and ambient lighting solution to subtly highlight when users need to take a break; and a social scoreboard tied to user's phones, allow them to collaborate, compete, and benchmark their improvement.

The concepts where tested over 4 weeks in three groups of 5 people: each concept individually, and both at the same time. All three groups were compared to a control group of 5 people. Over the 4 weeks, the test persons had to specify their active breaks in a mobile app. The first week provided baseline data, after which the test persons were introduced to the concepts, and spent 3 more weeks taking active breaks using the concepts.

Results

Each of the concepts improved the users behaviours in comparison to the control group.

Key takeaways

- **Behaviour First:**
  Throughout the design process the behaviour of users was the primary driver for the development and integration of the concepts in order to fit the use context, and be strongly evidence based. However, ethical considerations were also built into every step.

- **Ability, Motivation, and Trigger:**
  Collectively the concepts, made taking breaks easier, motivated the user via both System 1 and System 2 approaches, and served to trigger the new positive behaviour. By addressing all three elements cohesively the concepts were able to deliver substantially improved behaviour.

4.4 - Case 4: Public domestic waste in the City of Copenhagen

Project scope

Combining System 1 and System 2 interventions to reduce the amount of household waste in public bins in Copenhagen.

Project approach and investigations

This project worked through the initial project stages (Scope, Explore, and Design) outlined in Chapter 3 to deliver an integrated concept, consisting of:

- Imagery to trigger System 1.
- Confrontational icons and symbols to trigger both System 1 and System 2 reflection.
- Feedback to support System 2 reflection and longer term change.

The concept dealt with the different aspects of negative waste behaviour by redesigned the covering for public bins. These coverings were designed to facilitate each aspect of ability, motivation, and trigger.

The design team also identified the importance of addressing this behaviour directly in the home, and through other means, such as education, based on their fieldwork. This highlights the need to consider the whole sequence of behaviour and not only the problem product.

Results

The concepts developed in this project highlight the potential for combining System 1 and System 2 interventions in the environment where a behaviour is taking place.

Key takeaways

- **Combining System 1 and System 2:**
  Collectively the concepts addressed both System 1 and System 2 thinking to deliver an overall more effective intervention.
- **In situ:**
  At the heart of the concepts produced was that they would confront the user at the specific moment where they carry out the negative behaviour, targeting the behaviour directly as it happens.

This project was conducted as a master thesis by Francesco Faberi at DTU Management, autumn 2016, supervised by associate professor Philip Cash, assistant professor Jaap Daalhuizen and research assistant Camilla K. E. Bay Nielsen.

4.5 - Case 5: Cigarette disposal in the City of Copenhagen

Project scope

Combining System 1 and System 2 interventions to reduce the amount of cigarette stub littering at Dronning Louises bro in Copenhagen. Behavioural design was used to complement classic design thinking.

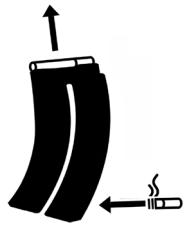
Project approach and investigations

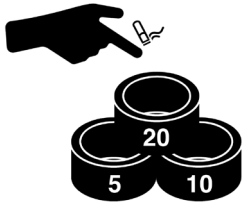
The project worked through four main project stages: Scope, Explore, Design, and Verify (from Chapter 3). The project investigated two main scenarios: one where the smokers walk and dispose of cigarette butts on the ground, and another where the smokers sit stationary in groups and dispose of cigarette butts on the ground. Studies of behaviour in these different contexts pointed to the need for developing a new packaging concept.

This concept particularly focused on 'ability', reducing the difficulty of disposing of used butts and by integrating disposal with the smoking behaviour made the new behaviour easier than the existing negative behaviour.

Results

The concept developed in this project highlights the importance of understanding the core behaviour and addressing all aspects of ability, motivation, and trigger. In particular, this concept enhanced ability – making the desired behaviour easier.





Key takeaways

- **Making it easier:**
  Core to the concept was increasing ability, and thus reducing the attractiveness of the littering. This is a key cue for using behavioural design (Chapter 2).

- **Evidence based design:**
  Key insights for this concept came from the direct observation of smoking behaviour. These observations also highlighted unexpected aspects of the behaviour, that reduced the effectiveness of current anti-littering interventions.

This project was conducted as a master thesis by Malte Ahlgren at DTU Management, autumn 2016, supervised by associate professor Philip Cash, assistant professor Jaap Daalhuizen and research assistant Camilla K. E. Bay Nielsen.

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www.designwithintent.co.uk

Behavioural design workbook
An introduction to behavioural design and its application in Copenhagen Commune.

Written by Camilla K. E. Bay Nielsen,
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Graphic design: Camilla K. E. Bay Nielsen & Johan Aakerlund.
Print: Vester Kopi.